

## Federation of Earth Science Information Partners Partnership Application

Please complete all sections to the fullest extent possible and forward completed application to: Carol Meyer, [carol.meyer@earthsciencefoundation.org](mailto:carol.meyer@earthsciencefoundation.org). If you have any questions, please contact her at 877.870.3747.

### I. CONTACT INFORMATION

#### A. Primary Contact/Principal Investigator

Name: Xiangming Xiao  
Address: Center for Spatial Analysis, University of Oklahoma, 101 David L. Boren Blvd, Norman, Ok 73019, USA  
Phone: (405) 325-8941  
Fax:  
Email: [xiangming.xiao@ou.edu](mailto:xiangming.xiao@ou.edu)

#### B. Designated Assembly Representative (could be same as above)

Name: Same as the above  
Address:  
Phone:  
Fax:  
Email:

#### C. Other Contacts

Name: Chandrashekhar Biradar  
Address: Center for Spatial Analysis, University of Oklahoma, 101 David L. Boren Blvd, Norman, Ok 73019, USA  
Phone: (405) 325-5568  
Fax:  
Email: [chandra.biradar@ou.edu](mailto:chandra.biradar@ou.edu)

Name:  
Address:  
Phone:  
Fax:  
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Phone:  
Fax:  
Email:

## II. ABOUT YOUR ORGANIZATION

### A. ORGANIZATION/DIVISION/PROJECT NAME:

University of Oklahoma / Center for Spatial Analysis / Earth Observation and Modeling Facility

### B. OVERVIEW OF YOUR PRIMARY ACTIVITIES in regards to the Earth Sciences Community (200 words or less)

The mission of the EOMF is to monitor and forecast the dynamics of the terrestrial biosphere. Our approaches are primarily (1) to integrate in-situ, airborne and space-borne observations and advanced models; and (2) engage citizen scientists for community remote sensing. The EOMF actively pursues and promotes community remote sensing through establishing cyberinfrastructure that enables science communities and citizens to participate in geo-referenced field photo data collection, archive, data exploration, visualization and analysis. We have used global satellite image data (e.g., MODIS, Landsat, and PALSAR) to map and track agriculture (e.g., cropping intensity, crop calendar, and irrigation), forests (e.g., forest area, deforestation, and degradation), and gross and net primary production.

The EOMF currently has a data center of 500 terabytes and we are in the process to expand it into a Peta-scale data center for Earth observation and Modeling at OU.

### C. Please list and briefly describe the primary product(s) or service(s) that your organization provides (will provide) to the Earth Sciences community.

We currently host a number of global-scale satellite images (e.g., MODIS, Landsat, and PALSAR) and data products (NDVI/EVI/LSWI, paddy rice, cropping intensity, and tropical evergreen forests).

1. Global Geo-Referenced Field Photo Library (<http://www.eomf.ou.edu/photos/index.php>). The GeoPhoto library offers the capacity for users to upload, query (by themes and geographically), and down-load geo-referenced field photos in the library. It offers interactive capacity for users to interpret and classify field photos into relevant land cover types and build a photo-based land cover database. The users can use both the photos and associated thematic database to carry out land use and land cove analysis in geographical information system.

2. MODIS data products: In addition to NDVI and EVI data products, we also provide Land Surface Water Index (LSWI) data product derived from MODIS 8-day composites at 500m spatial resolution. LSWI data are now widely used for the studies of land surface phenology, water stress, and gross and net primary production.

3. A web –based visualization system for users to visualize time series data of individual pixels from MODIS, and maps of vegetation indices from MODIS.

4. A web-based on-demand modeling system under development, when it is completed, users can run advanced models to estimate biophysical and biochemical parameters, carbon fluxes and biomass.

D. Please give a main website address for the proposed Partnership:

Web Address: <http://www.eomf.ou.edu>

### **III. HOW YOUR ORGANIZATION WILL BENEFIT FROM/CONTRIBUTE TO THE EARTH SCIENCE INFORMATION PARTNERS (ESIP) FEDERATION**

- A. Describe current or anticipated users of your products and services and how you think the Federation can help you better serve this population. (200 words or less)

Our current users are largely composed of scientist and researchers who are interested in linking satellite data with their in-situ field work. We anticipate having more citizen scientists to be the end users and data providers, once our web data portal becomes more user friendly, well informed to the society. ESIP Federation has many years of experience in users and advanced web-programming skills for large geospatial datasets, which could help us to accelerate the web development for data exploration, visualization and analysis.

- B. Describe any Earth science technologies that you have developed and are willing to bring to the Federation's efforts to provide best-practices. (200 words or less)

Our EOMF data portal provides advanced infrastructure and automation services for scientific research work-flow that operates under an extensive global dataset archive. The work-flow includes data acquisition, inventory, processing, exploration, visualization and analysis, as well as publication of products and global datasets. The system is based on a loosely coupled modular design with various components incorporating multiple open source technologies and standards. The majority of the system is written in Python. The database underlying the project is PostgreSQL spatially enabled with PostGIS. The acquisition component supports multiple communication protocols and incremental data load. The inventory component allows for distributed data storage, flexible data categorization and real-time inventory display. Processing management component relies on MODIS processing software written in IDL, GDAL for manipulating raster data, OGR for vector data, and supports interfacing with any other scientific analysis tools. Data is exported for visualization using industry-standard methods for geographic data access, such as the OpenGIS Consortium's Web Mapping Service (WMS) and Web Feature Service (WFS) protocols, as well as Keyhole Markup Language (KML) data format. MapServer renders spatial data for WMS and GeoDjango is used to generate GML and KML dynamically with data specific attributes. Shapelib library is used to export vector data as ESRI shapefiles. Pythons Matplotlib library allows to plot any data in real-time.

- C. Describe how your proposed membership would contribute to the efforts and the mission of one or more standing committees, working groups and/or clusters. See Page 3 for descriptions of the different activities of the various standing committees, working groups, and clusters. (200 words or less)

We can contribute to the missions of the Products and Service Committee, as we provide real-time MODIS data in a user-friendly way. The GeoPhoto library will engage citizen scientists for data collection. We can also contribute to the clusters of Web Service, Preservation and Stewardship, and Decision. Our MODIS data products will directly serve the needs in societal benefit areas such as carbon, ecological forecasting and public health.

- D. Describe your own use of Earth science information and data and how you would see this use enhanced by your partnership in the Federation. (200 words or less)

We assemble and integrate various data sets from the scientific communities, e.g., satellite telemetry of wild birds, climate data, DEM, and infectious disease data. Our membership will provide additional capacity (e.g., a Peta-scale data storage system, improved data products, advanced satellite-based models) to enhance the Federation.

**IV. YOUR CHOICE OF MEMBERSHIP TYPE. PLEASE PICK ONE.**

ESIP-I (primarily a data center/archive) ☐

ESIP-II (primarily a research center) ☒

ESIP-III (primarily applications and education) ☐

ESIP-IV (primarily a sponsoring member) ☐

**V. Any other comments about your proposed membership and its relation to the Federation that you wish to provide.**

**Thank you for your application for partnership in the ESIP Federation.**

## List of Federation Committees and Clusters

### Administrative Committees

*Executive Committee:* Comprised of all standing and administrative committee chairs, ESIP Type Representatives, the President and Vice President of the Federation. Oversight body for most day-to-day activities of the Federation, acts on behalf of the Assembly between meetings.

*Constitution and Bylaws:* Provides counsel on matters related to the constitution and bylaws and other related issues (e.g. amendments to government documents)

*Finance and Appropriations:* Oversees financial resources of the Federation, including the annual budgeting process.

*Partnership:* Reviews and processes all applications for membership before making applications available for review by members of the Federation. Deals with other membership-related issues.

### Standing Committees:

*Commercial Development:* Promotes a forum wherein commercial development of Earth science information can be fostered. (inactive)

*Community Engagement:* Provides a forum for the Federation to promote partner products and to engage new users for data products and services. (inactive)

*Education:* Provides a forum to make accessible to educators and learners at all levels in both formal and informal educational contexts the Earth science data, information, tools, and curricula available within the ESIP Federation.

*Information Technology and Interoperability:* Provides a forum for discussing information technology and interoperability issues of the Earth science community and serves as a central point for activities in this realm.

*Products and Services:* Provides a forum for defining best practices and defining requirements for earth science products and services. Currently is involved in developing an inventory of partner products and services.

### Clusters (presently active, April 2009):

Web Services  
Semantic Web  
Data Preservation and Stewardship  
Decisions  
Air Quality  
Federated Search  
Water